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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER				
BURKHART, ELIZABETH A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/516,448

Applicant(s)

WARD, LUKE

Examiner

ELIZABETH A. BURKHART

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-31 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-32 are pending in this application. Amended claims 1, 16, and 27 are noted. The amendment filed 1/31/2008 has been entered and carefully considered.

Election/Restrictions

2. This application contains claim 32 drawn to an invention nonelected with traverse in the reply filed on 1/31/2008. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

The Examiner would also like to point out that the text of withdrawn claims (Claim 32) must be included in the claims set. Applicant should either include the text of withdrawn claim 32 or cancel said claim in their response to the final rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3-5, 10, 11, 14, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gitzhofer et al. ('921) in view of Heinecke et al. ('690).

Gitzhofer discloses a method for depositing a coating on a substrate (Col. 1, lines 7-10) comprising atomizing the coating forming material and activating the atomized coating forming material by a plasma discharge prior to the material being deposited on the substrate (Col. 2, lines 32-39). An atomizer having a pump to supply the coating monomer to said atomizer is disclosed (Col. 4, lines 11-13). The plasma discharge can be operated at atmospheric or less than atmospheric pressure (Col. 3, lines 51-52). The

plasma is created by radio-frequency discharge, which is a type of electromagnetic radiation (Col. 3, lines 39-47). The substrate is located outside of the plasma discharge during coating deposition (Col. 4, lines 43-61). The solvent evaporates under the extreme heat of the plasma (Col. 4, lines 52-54). The extreme heat generated by the plasma would also heat the area surrounding the plasma.

Gitzhofer does not disclose that the plasma is pulsed.

Heinecke discloses a method for depositing a coating on a substrate by using pulsed RF plasma techniques in order to deposit coating material onto a heat-sensitive substrate (Col. 1, lines 28-45)

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the method of Gitzhofer wherein the plasma is pulsed as suggested by Heinecke in order to deposit coatings onto a heat-sensitive substrate.

Thus, claims 1, 3-5, 10, 11, 14, and 25 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Gitzhofer and Heinecke.

4. Claims 1-4, 10, 12, 13, 15, 17-21, 24, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodwin et al. (2004/0022945) in view of Badyal et al. ('950).

Goodwin discloses a method for depositing a coating on a substrate by introducing an atomized coating forming material into an atmospheric pressure plasma discharge prior to being deposited onto a substrate ([0006]). The plasma discharge retains the chemical properties of the atomized coating forming material ([0019]). The atomizer is connected to a syringe pump for supplying coating forming monomer to said

atomizer ([0023]). The plasma discharge is created by any conventional means of generating a glow discharge, which is a flux of ionized particles ([0010]). The substrate is located inside the plasma discharge during coating deposition ([0009]). The substrate may be any material (e.g. metal, ceramic, polymer, woven or non-woven fibers, natural fibers, synthetic fibers, cellulosic material and powder) ([0017]). The coating forming monomer material may be solid, liquid, gaseous, organic or inorganic or mixtures thereof ([0012]). The atomizer may be an ultrasonic nozzle ([0023]) wherein the coating material is a liquid or liquid/solid slurry ([0006]). A plurality of atomizers may be used ([0011]). Goodwin also discloses a method of producing a multilayer coating on a substrate by exposing the substrate to the excited coating forming material repeatedly [0020] and that the coating may be post-treated or pre-treated by exposure to an exciting medium [0014].

Goodwin does not disclose that the plasma discharge is pulsed.

Badyal discloses a method of coating a surface with a polymer layer using a pulsed plasma discharge in order to achieve a greater level of structural retention (Col. 4, lines 49-56).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the method of Goodwin wherein the plasma discharge is pulsed as suggested by Badyal in order to achieve a greater level of structural retention.

Regarding Claims 1 and 27, the plasma sources of Goodwin would serve to chemically activate the coating forming material.

Regarding Claim 26, Goodwin discloses the same substrate material and the same coating forming material, thus the coated substrate would be subject to derivatization.

Regarding Claim 29, since the liquid is a monomer, the precursor species must be monomeric ions.

Regarding Claim 31, since the coating material may be a liquid rather than a suspension of particles within a carrier liquid, the plasma discharge would contain the coating material in the absence of other materials.

Thus, claims 1-4, 10, 12, 13, 15, 17-21, 24, and 26-31 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Goodwin and Badyal.

5. Claim 6, 7, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gitzhofer et al ('921) in view of Heinecke et al. ('690) as applied above and further in view of Wang ('105).

Gitzhofer and Heinecke do not disclose atomizing the coating forming material using a nebulizer wherein the coating forming material is in the form of a liquid or liquid/solid slurry and a carrier gas.

Wang discloses a method for the deposition of a coating comprising an atomized material of reactants to form said coating that is subjected to radio-frequency radiation in a plasma region and thereafter the vaporized mixture is deposited on a substrate (Col. 2, lines 55-64), wherein the atomized material is created by the use of an

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ultrasonic nebulizer (Col. 2, lines 47-51) and the atomized material to form said coating is contacted with a carrier gas. (Col. 4, lines 3-5).

It would have been obvious to one of ordinary skill in the art at time of invention by applicant to perform the method of Gitzhofer in which the plasma is pulsed as suggested by Heinecke, wherein the nebulizer as suggested by Wang is substituted for the ultrasonic nozzle because the carrier gas facilitates the formation of plasma and facilitates the movement of the mist from the misting chamber to the plasma region.

Regarding Claims 6 and 7, Wang discloses adding oxygen to the atomized material to enhance the oxidation of the material (Col. 5, lines 12-17). The oxygen would also act to carry the material in the direction of the oxygen flow. Therefore it would have been obvious to have added oxygen to the atomized coating material as disclosed by Wang since both Wang and Gitzhofer are concerned with the formation of oxides and one would reasonably expect to achieve enhanced oxidation of the coating material to form said oxides.

Thus, Claims 6, 7, and 22 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Gitzhofer, Heinecke, and Wang.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.

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1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 14 of copending Application No. 10/514661. Although the conflicting claims are not identical, they are not patentably distinct from each other because although they differ in scope, the claims of 10/514661 anticipate the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 6-11, 14, and 20-23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5-8, 11, and 15-21 of copending Application No. 10/514661 in view of Badyal et al. ('950).

Application No. 10/514661 does not disclose in the aforementioned claims that the exciting medium is pulsed.

Badyal et al. ('950) is relied upon as discussed in the 35 USC 103 rejections above.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the claimed method of Application No. 10/514661 wherein

the exciting medium is pulsed as suggested by Badyal et al. ('950) in order to achieve a greater level of structural retention.

This is a provisional obviousness-type double patenting rejection.

Allowable Subject Matter

8. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The relevant prior art does not disclose forming a multilayer coating wherein the nature of the exciting medium is changed during the coating formation (i.e. pulsed plasma to pulsed UV). The relevant prior art states that for a multilayer coating multiple plasma chambers may be used, but not the use of a plasma chamber followed by a UV or electron beam chamber.

It is noted that Applicant amended claim 16. However, it was not rewritten in independent form, but rather is in multiple dependent form.

Response to Arguments

9. Applicant argues that the Examiner's reasoning "in order to deposit coatings onto a heat sensitive substrate" does not provide reasons that the skilled artisan would modify Gitzhofer with the teachings of Heinecke. The examiner disagrees. Applicant poses the question why the reason for modifying Gitzhofer would be to deposit onto a heat-sensitive substrate. Heinecke discloses a pulsed plasma process in order to form good inorganic coatings onto a heat-sensitive substrate such as plastics. Gitzhofer

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discloses a continuous plasma process to deposit bioceramic materials (inorganic materials used for implants) onto a substrate. Gitzhofer does not disclose the substrate material, so it would have been within the ordinary skill in the art to incorporate the pulsed plasma process of Heinecke into the process of Gitzhofer when using a heat-sensitive substrate material, such as if one wanted to produce a lighter weight implant.

10. Applicant argues that neither Gitzhofer nor Heinecke disclose "chemical activation of the atomized coating forming material." The examiner disagrees. Gitzhofer discloses that as the atomized material travels through the plasma, it is subjected to several physicochemical transformations, wherein physicochemical is defined as being physical and chemical (Merriam Webster).

11. Applicant argues that neither Gitzhofer nor Heinecke disclose the new limitation "the exciting medium is pulsed to significantly retain the chemical properties of the atomized coating forming material. The examiner agrees and the rejection of Claim 27 over Gitzhofer in view of Heinecke has been withdrawn.

12. Applicant argues that there is no language in Wang to suggest using a nebulizer to deposit an atomized coating forming material. Gitzhofer discloses that alternative atomizing processes are available other than an atomizing probe (Col. 4, lines 41-42) for depositing an atomized coating forming material. Wang discloses that a nebulizer is a conventional means of atomizing a solution (Col. 3, lines 40-46). Thus, it would have been obvious to one of ordinary skill to modify Gitzhofer by using an alternative atomizing technique, such as a nebulizer, to deposit the atomized coating forming material.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIZABETH A. BURKHART whose telephone number is (571)272-6647. The examiner can normally be reached on M-Th 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elizabeth A Burkhart/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792